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10/648,772

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EXAMINER

PRABHAKHER, PRITHAM DAVID

ART UNIT

PAPER NUMBER

2622

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/648,772

Applicant(s)

TAKAHASHI ET AL.

Examiner

Pritham Prabhakher

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,6,12-15,17 and 18 is/are allowed.
- 6) ☒ Claim(s) 3 and 4 is/are rejected.
- 7) ☒ Claim(s) 7-11 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 05/03/2007 have been fully considered but they are not persuasive.

1. In regard to **Claims 3 and 4**, the applicant argues that the Sato reference does not disclose that the clamping capability within a predetermined period after the start of image capturing by the solid image-capturing element is controlled to be higher in level than the clamping capability attained in another period. The applicant also argues that gives no description to provide an implication that S11 or S31 corresponds to a time when image capturing has begun.

The examiner respectfully disagrees with this assertion. It is of the examiner's opinion that Figure 3 of the Sato reference corresponds to a time after the start of image capturing, because Wave (a) is described as an image signal outputted from the clamp circuit 40. Therefore, Wave (e) which shows the clamping voltage, shows the clamping voltage after the start of image capturing, **see Column 4, Lines 54 et seq. and Column 5, Lines 10-12**. Also, in the examiner's opinion, the clamping voltage shows a clamping capability, and the period between S31 and S50 is shown as becoming higher than the period between S11 and S31, **Figure 3**. Although Column 5, Lines 13-20 and 40-41 of Sato do not specifically mention the periods between S31 and S50, in the examiner's opinion, there is sufficient evidence present in Figure 3 to read on Claims 3 and 4.

Therefore, for the reasons mentioned above, the rejections from claims 1-4 for the previous office action will be repeated for claims 3 and 4.

Specification

Claims 17 and 18 are objected to because of the following informalities:

The word "solid" is spelt as "sold".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 3 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by

Sato (US Patent No.: 6580465B1).

*In regard to **Claim 3**, Sato teaches of an image capturing device, comprising:*

*a solid image capturing element (Image sensor 20 in **Figure 1**);*

*a driving circuit for driving the solid image capturing element to obtain an image signal (Generator 10 functions as a driving circuit for capturing an image, **Figure 1 and Column 3, Lines 13-15**);*

*a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level (The clamp circuit 40 clamps a predetermined portion of the image signal input into the clamp circuit 40, **Column 3, Lines 18-23**); and*

*a control circuit for controlling clamping capability of the clamping circuit (Claim level adjusting circuit 90 controls the clamping capability of the clamp circuit 40, **Figure 1**);*

*wherein the control circuit controls such that a clamping capability attained within a predetermined period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period (Wave (e) in Figure 3 shows the clamp voltage outputted from the clamp voltage adjusting circuit 90 (control circuit) that is input into the clamp circuit 40 to control it. Figure 3e shows that the clamping voltage from S11 to S31 (one period) is different from S31 to S50 (second period), therefore, the clamping capability of the clamp circuit 40 is also different, **Figure 3 and Column 5, Lines 10-12**); and*

wherein the control circuit controls such that the clamping capability within a predetermined period after start of image capturing (both periods mentioned in the above paragraph fall under this category) by the solid image capturing element becomes higher in level than the clamping capability attained in another period (The

*period from S31 to S50 has a higher level in clamping capability than the period from S11 to S31, **Figure 3 and Column 5, Lines 52-53**.*

*Regarding **Claim 4**, Sato teaches of an image capturing device, comprising:*

*a solid image capturing element (Image sensor 20 in **Figure 1**);*

*a driving circuit for driving the solid image capturing element to obtain an image signal (Generator 10 functions as a driving circuit for capturing an image, **Figure 1 and Column 3, Lines 13-15**);*

*a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level (The clamp circuit 40 clamps a predetermined portion of the image signal input into the clamp circuit 40, **Column 3, Lines 18-23**); and*

*a control circuit for controlling clamping capability of the clamping circuit (Claim level adjusting circuit 90 controls the clamping capability of the clamp circuit 40, **Figure 1**);*

wherein the control circuit controls such that a clamping capability attained within a predetermined period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period (Wave (e) in Figure 3 shows the clamp voltage outputted from the clamp voltage adjusting circuit 90 (control circuit) that is input into the clamp circuit 40 to control it. Figure 3e shows that the clamping voltage from S11 to S31 (one period) is different from S31 to

*S50 (second period), therefore, the clamping capability of the clamp circuit 40 is also different, **Figure 3 and Column 5, Lines 10-12**); and*

*wherein the control circuit controls such that the clamping circuit operates longer within a predetermined period after start of image capturing by the solid image capturing element than in another period (The clamping circuit operates longer between the periods of S31 and S40 than S30 and S31, **Figure 3**).*

Allowable Subject Matter

Claims 7,8 and 16 are objected to as being dependent upon a rejected base claim 3, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 9,10 and 11 are objected to as being dependent upon a rejected base claim 4, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 5-6, 12-15 and 17-18 are allowed.

The following is an examiner's statement of reasons for allowance:

*In regard to **Claim 5**, the closest prior art of record fails to teach or reasonably suggest "an image capturing device, comprising: a solid image capturing element; a*

driving circuit for driving the solid image capturing element to obtain an image signal; a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level; and a control circuit for controlling clamping capability of the clamping circuit; wherein the control circuit controls such that a clamping capability attained within a predetermined period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period; wherein **the clamping circuit comprises two or more clamping circuit sections, and the control circuit controls such that a larger number of clamping circuit sections operate within a predetermined period after start of image capturing by the solid image capturing element than in another period**".

Regarding **Claim 6**, this claim is allowed as being dependent on allowed independent claim 5.

With regard to **Claim 12**, the closest prior art of record fails to teach or reasonably suggest, "an image capturing device, comprising: a solid image capturing element; a driving circuit for driving the solid image capturing element to obtain an image signal; a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level; a control circuit for controlling such that a clamping capability attained within a predetermined

period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period; and

a detection circuit for measuring an inoperative period during which the solid image capturing element suspends image capturing, wherein the control circuit controls such that the clamping capability within a predetermined period after start of image capturing by the solid image capturing element becomes higher in level than the clamping capability attained in another period, and controls such that the clamping capability becomes higher in level with respect to a longer inoperative period".

Regarding **Claims 13-15**, these claims are allowed as being dependent from allowed independent claim 12.

With regard to **Claim 17**, the closest prior art of record fails to teach or reasonably suggest "an image capturing device, comprising: a solid image capturing element; a driving circuit for driving the solid image capturing element to obtain an image signal; a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level; and a control circuit for controlling clamping capability of the clamping circuit; wherein the control circuit controls such that a clamping capability attained within a predetermined period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period; **further comprising: a plurality**

of buffer circuits for outputting a predetermined reference voltage; a selector for selecting at least one of the plurality of buffer circuits; a switch connected between the buffer circuit selected by the selector and a signal line connected to an output terminal of the solid image capturing element, for switching between in an on state and in an off state, wherein the control circuits controls the clamping capability by changing either a type or a number of the buffer circuit selected by the selector.

Regarding **Claim 18**, the closest prior art of record fails to teach or reasonably suggest "an image capturing device, comprising: a solid image capturing element; a driving circuit for driving the solid image capturing element to obtain an image signal; a clamping circuit for clamping a reference level of the image signal generated by the solid image capturing element at a predetermined level; and a control circuit for controlling clamping capability of the clamping circuit; wherein the control circuit controls such that a clamping capability attained within a predetermined period after start of image capturing by the solid image capturing element becomes different from a clamping capability attained in another period; **further comprising: a plurality of buffer circuits for outputting a predetermined reference voltage; a selector for selecting at least one of the plurality of buffer circuits; a switch connected between the buffer circuit selected by the selector and a signal line connected to an output terminal of the solid image capturing element, for switching between in an on state and in an off state, wherein the control circuits controls the clamping**

capability by changing at least one of a period in which the switch remains in an on state, a type of the buffer circuit selected by the selector, and a number of the buffer circuit selected by the selector.

The following are the closest references found:

Funakoshi et al. (US Patent No.: 7061531B2) teaches of "An imaging device that uses a solid state imaging element, during multi-field accumulation to prevent shading and oscillatory phenomena such as repeated black and white patterns. A signal is supplied from a timing signal generation circuit to switches, and controls the ON/OFF operation. During the H period of the signal, the switch is closed, and the output value of an amplifier is input to a capacitor. During the L period of the signal, the switch is opened, and the average value of the output of the amplifier is maintained in the capacitor. During the H period, the switch is open, while during the L period, the switch is in the ON state. At this time, the level of the capacitor C2 and the output of the amplifier are input to an amplifier, and their difference is amplified and supplied to a capacitor C3 via the switch".

Yoshihara et al. (US Patent No.: 6480228B1) teaches of "When a signal output by a solid-state image sensing device is clamped to a predetermined reference potential, a high voltage generated in a transfer suspension period after the clamping is generally supplied to an A/D converter as generated. A sample/hold output V_a is clamped to a clamp level V_{ref} over a period of time between a halfway point of time of a signal of a picture element preceding ahead by one line and the end of an inhibit period

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of transfer clocks of a signal output by an empty transmission unit via a first clamp pulse and a sample/hold output for the second picture element, or a subsequent one of an OPB unit is clamped to the clamp level via a second clamp pulse to prevent a signal output from exceeding a reference voltage from being supplied to an A/D converter at a later stage".

Abe (US Patent No.: 6700609B1) teaches of "An optical black portion in an output of a CCD image pickup device that is extracted and a clamp level of each line that is obtained by an integrating and averaging circuit. A difference value of the clamp levels between the front and rear lines and an absolute value of the difference are calculated by a comparing circuit. Either the clamp level of each line or the clamp level updated every (+1) or (-1) is selected by a selector in accordance with whether the absolute value of the difference of the clamp levels between the front and rear lines lies within a predetermined range or not. The clamp level which is outputted from the selector is subtracted from the output of the CCD image pickup device".

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pritham Prabhakher whose telephone number is 571-270-1128. The examiner can normally be reached on M-F (7:30-5:00) Alt Friday's Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Pritham . D. Prabhakher

A handwritten signature in black ink, appearing to read 'David Ometz', with a long horizontal flourish extending to the right.

DAVID OMETZ
SUPERVISORY PATENT EXAMINER